

**Haemoglobin as a simple marker of HIV disease progression among
ARV naïve adults in Nairobi, Kenya**

Mary Nyiva Mutisya

89700

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ABSTRACT

Acquired immunodeficiency syndrome (AIDS) caused by the human immunodeficiency virus (HIV) continues to be a major threat to human kind. Quantitative measures of CD4⁺ T- lymphocytes and viral load in peripheral blood are still considered to be the most reliable markers of HIV disease progression; however the processing of blood samples for CD4⁺ T-cell counts requires complicated and expensive machines that are not available in most Kenyan health facilities. Full blood count to determine haemoglobin levels can be cheaply and conveniently done in most district hospitals and CDF-funded health centers' countrywide. This study evaluated the potential role of haemoglobin as a simple marker of HIV disease progression among ARV naïve patients in Nairobi. The study was carried out at the KEMRI-FACES clinic and laboratory at the Centre for Respiratory Diseases Research (CRDR), KEMRI. Ethical approval for the use of patient blood samples was granted by the KEMRI Ethical Review Committee (ERC). A total of 167 patients aged between 18-60 years from both sexes who obtained full blood count, CD4⁺ and CD3⁺ T-cell measurements were enrolled for the study. Blood was taken by venipuncture and collected in 4ml vacutainer tubes with 1.0ml EDTA anticoagulant. CD4⁺ and CD3⁺ T- lymphocytes counts were measured by FACS count while haemoglobin levels were determined by full blood count using automated analyzers. The patients were followed for six months with the first follow-up visit after three months and the second follow-up visit after six months. Correlations between CD4⁺ T cell count, haemoglobin levels and WHO clinical staging system were evaluated using Spearman rank correlation. The correlation between haemoglobin and CD4⁺ T

cells at enrolment was 0.388 while at follow-up one, 0.0089 and 0.0547 at follow-up two. At enrolment, patients in WHO stage 1 had a median CD4 count of 588 and were negatively correlated at -0.05. The correlation between haemoglobin and CD4/CD3 ratio at enrolment was 0.861, at follow-up 1, 0.798 and at follow-up 2, 0.422. This was not significant. At 95% confidence interval, the difference was not significant and therefore it was concluded that with the new WHO CD4⁺ T cell count cut-off of above 350, haemoglobin levels, CD3/CD4 ratio and WHO staging do not correlate. Screening and enrolment of patients took a long period of time than expected due to the change by WHO of patients eligible for ARVs from 200 to 350 cells/ μ l of blood. Further research is recommended on the impact of new treatment regimens on haemoglobin levels and the resulting correlation between CD4⁺ count and haemoglobin levels in patients under ARVs.